

# THE CHEMIST

March, 1957

VOLUME XXXIV

NUMBER 3



**Dr. Charles L. Thomas, F.A.I.C.**  
Receives Pennsylvania AIC Chapter Honor Scroll  
(See Page 85)



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in articles which appear in THE CHEMIST.

SCHEDULED FOR EARLY PUBLICATION

Sixteen Years of Chemical Education in China, Dr. Peter P. T. Sah

Should Consulting Engineers Advertise? (Reprint), Richard L. Moore, F.A.I.C.

The Relationship of Scientific Manpower to the Future Economic Prosperity and Security  
of the Nation, D. H. Dawson.

The Case for Inverted Education, John E. Thompson, F.A.I.C.

Award of Honorary AIC Membership to Lawrence H. Flett.

The Pursuit of Invention, L. H. Flett.

Award of Honorary AIC Membership to Joel H. Hildebrand.

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### Deadlines for *The Chemist*

Consistent with our plans to move the publication date of *THE CHEMIST* to the first of the month by degrees, new deadlines are in effect. Copy for the May issue of *THE CHEMIST* should be in our hands by April 10th or earlier if possible. Advertising deadlines for May are April 15th at latest.

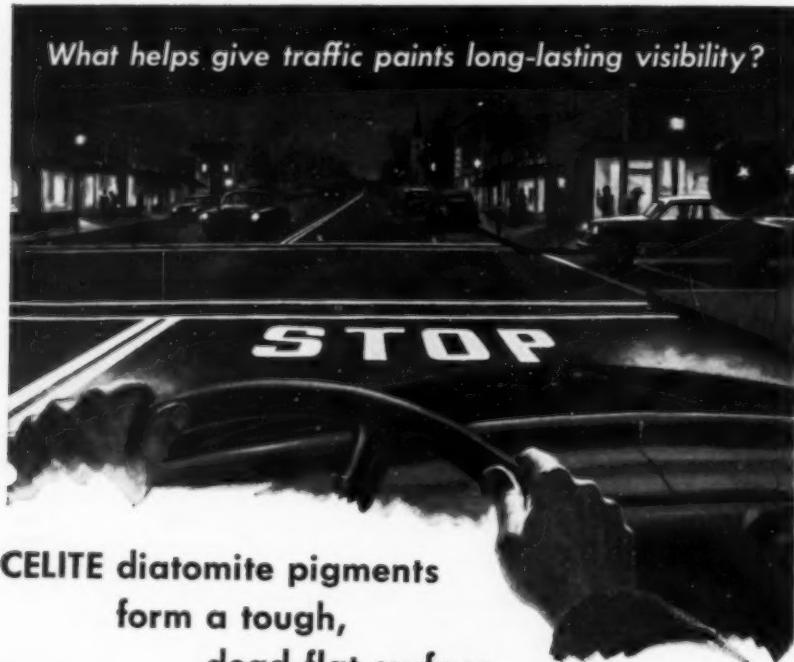
### TO COME IN APRIL

Our former President, Lawrence H. Flett, brings us a significant paper on "The Pursuit of Invention." He receives Honorary AIC Membership at the March meeting of the New York Chapter. Another excellent paper will be that of David H. Dawson, vice president of E. I. du Pont de Nemours & Co., on "The Relationship of Scientific Manpower to the Future Economic Prosperity and Security of the Nation."

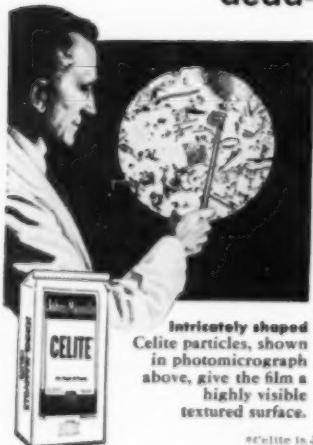
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## EDITORIAL 1957 Elections

**Dr. Lloyd Van Doren, F.A.I.C.**

*Secretary, The American Institute of Chemists, Inc.*

**F**ELLOWS and Members of THE AMERICAN INSTITUTE OF CHEMISTS are eligible to vote for AIC officers and councilors. Elections are held annually and the results are announced at the Annual Meetings of the INSTITUTE. This year, a president-elect and three councilors are to be elected to take office at the Annual Meeting in Akron, Ohio, May 23, 1957.

About March 20th, a nomination ballot will be mailed to Fellows and Members. This ballot will contain the names of those who have accepted the nominations made by the Committee on Nominations. Voters may vote for these candidates or may nominate others.

After the nominating votes have been tallied, the names will be arranged in the order of the number of nominating votes, on an election ballot to a total of three candidates for the office of president-elect and six candidates for the three councilorships to be filled. This election ballot will be mailed to the voters about April 20th.

We urge every Fellow and Member in the INSTITUTE to return ballots promptly so that the elected officers may truly represent the choice of the membership. Our experience has shown that only about thirty per

cent of the membership votes in elections. This year, we hope that at least sixty per cent will vote.

As we go to press, the following candidates will appear on the Nomination Ballot: (There may be additional acceptances before the ballot appears.)

### For President-elect

(*to succeed the President in 1958*)

Dr. John R. Bowman, Director of Research, Mellon Institute, Pittsburgh, Pa.

Dr. Cecil L. Brown, Assistant Manager, Research and Development, Esso Research and Engineering Co., P.O. Box 51, Linden, N.J.

Dr. Lloyd A. Hall, Technical Director, The Griffith Laboratories, Inc., Chicago 9, Illinois.

Dr. Milton Harris, Director of Research, The Gillette Co. Washington 11, D.C.

Dr. Emil Ott, Director, Central Chemical Research; Vice President, Chemical Division, Food Machinery & Chemical Corp., P.O. Box 8, Princeton, N.J.

Dr. George L. Royer, Administrative Assistant to General Manager, Research Division, American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N.Y.

Dr. William J. Sparks, Director, Esso Research & Engineering Co., Linden, N.J.

### For Councilors

(*To serve for three-year terms*)

Chester A. Amick, Technical Patent Assistant, American Cyanamid Co., Bound Brook, N.J.

Dr. Johan A. Bjorksten, President, Bjorksten Research Laboratories, P.O. Box 265, Madison 1, Wisconsin.

- Dr. Johannes H. Bruun, Director, Research and Development, Hooker Electrochemical Co., Niagara Falls, N.Y.
- Dr. D. L. Cottle, Research Chemist, Esso Research & Engineering Co., Linden, N.J.
- Dr. Eduard Farber, Chief Chemist, Timber Engineering Co., 4812 Minnesota Ave., N.E., Washington, D.C.
- Dr. Charles H. Fisher, Chief, Southern Utilization Research Branch, Southern Regional Research Lab., 1100 Robert E. Lee Blvd., New Orleans 19, La.
- Karl M. Herstein, President, Herstein Laboratories, 44 New St., New York 4, N.Y.
- Albert C. Holler, Director, Chemical Div., Twin City Testing & Engineering Laboratory, 2440 Franklin Ave., St. Paul 14, Minn.
- Dr. Maurice J. Kelley, Director, Organic Research Lab., Nopco Chemical Co., Harrison, N.J.
- John Kotrady, Technical Assistant, Beacon Research Labs., The Texas Company, Beacon, N.Y.
- Dr. F. A. Lowenheim, Research Chemist, Metal and Thermit Corp., Box 255, Rahway, N.J.
- Paul E. Reichardt, Executive Assistant, Washington Gas Light Co., 1100 H St., N.W., Washington 1, D.C.
- Marcus Sittenfeld, Consulting Chemical Engineer, Marcus Sittenfeld Associates, 1411 Walnut St., Philadelphia 2, Pa.
- Dr. Carl J. Wessel, Assistant Director, Prevention of Deterioration, National Research Council, 2101 Constitution Ave., Washington 25, D.C.

## Special AIC Announcements

### 1957 Annual Meeting

The 1957 Annual Committee has nearly completed plans for the Thirty-fourth Annual Meeting to be held May 22-24, 1957, at the Sheraton-Mayflower Hotel, Akron, Ohio.

The Committee Chairmen who are working to make this one of the best AIC Meetings yet held are:

*Honorary Chairman,*  
Dr. Ray P. Dinsmore

*General Chairmen:*  
Dr. M. J. Hiler  
Doris F. Siddall

*Program Chairmen:*  
Dr. Henry B. Hass  
Dr. J. D. D'Ianni

*Arrangements, Dr. O. D. Cole*  
*Registration, Dr. E. M. Glymph*

*Publicity, J. J. Hartz*  
*Sergeant at Arms, E. R. Bronstein*  
*Secretary-Treasurer, D. F. Behney*

At this Annual Meeting, the Gold Medal of the AIC will be presented to Dr. Roy C. Newton, Hon. AIC, vice president of Swift and Company, Chicago, Ill. Dr. L. A. Maynard, chairman, Division of Biology and Agriculture, National Research Council, Washington, D.C., will speak for the medal recipient.

The general theme of the Annual Meeting will be, "The Chemist and Management Appraise Each Other;" and a top-flight panel of speakers on various phases of this theme is being assembled.

## SPECIAL AIC ANNOUNCEMENTS

### New Jersey Chapter Joins Group Insurance Plan

The New Jersey AIC Chapter has decided to join the New York Chapter in participating in the Group Health and Accident Insurance Plan which the New York Chapter adopted last year. Information is being sent out to members of the New Jersey Chapter.

### Student Medalist Contest

Each year AIC Chapters award Student Medals to seniors in chemistry or chemical engineering chosen from colleges and universities in their respective areas. Those selected are chosen on the basis of their records, with emphasis placed on demonstrated leadership ability, character, and high scholastic standing. In addition to the medal, each medalist receives a year's subscription to *THE CHEMIST*.

Student medalists, beginning with those chosen this year, are now eligible to compete for a \$100 prize by submitting an essay on "Chemistry (or Chemical Engineering) as a Profession."

Manuscripts should be about 2000 words in length; typed, double-spaced, on plain white paper. The student's name and address should be clearly written on a separate piece of paper and placed in the envelope with the manuscript. Manuscripts should be sent to "Student Medalist Contest," c/o The American Insti-

tute of Chemists, 60 E. 42nd St., New York 17, N.Y. before September 16, 1957. They will then be assigned a number and given to the Student Medal Committee, who will choose the best one. The author of this manuscript will receive \$100. Everyone who enters the contest will receive an additional two-year subscription to *THE CHEMIST*.

### To AIC Chapter Secretaries

Once a year, whenever AIC Chapter Secretaries prefer it, the Chapters' lists of their members may be sent to the AIC Secretary at 60 East 42nd Street, New York 17, N.Y., where they will be reviewed and, if necessary, brought up to date and returned. Changes of address, new members, and losses of members, affecting the Chapters, will continue to be sent, as usual, at intervals during the year. However, it has been found that sometimes mailing lists, after a period of time, accumulate errors. For this reason, an annual review of the Chapters' lists is desirable.

---

**Expansion:** For Arthur D. Little, Inc., announced by Earl P. Stevenson, F.A.I.C., chairman of the board. Purchase of 170 acres in Concord, Mass., by the company's Pension Trust, and immediate new construction at Acorn Park in Cambridge, Mass., are included in these plans.

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# On Being A Real Chemist

Dr. Charles L. Thomas, F.A.I.C.

Director of Research and Development, Sun Oil Co., Philadelphia 3, Pa.

AS I describe the chemist, I shall say some things that may not be fair since I am going from the specific to the general. We have heard the chemist described as one who is introverted, likes to work alone, self-centered, dreamer, visionary, creative, idealist, egotist, needs understanding and appreciation; especially needs fellow chemists to admire his work, abhors regimentation, and frequently is an administrative problem! The British scientist, Sir Edward Bullard, insisting that all creative scientists are neurotic, recently said, "One of my best research workers started wearing socks at thirty-five!"

In their desire for recognition, chemists seek "professional status." Virtually all of the AIC activities deal with the professional status of chemists in one way or another. In trying to help the chemist get recognition, what have we been doing? We have been suggesting that he take part in civic affairs, get on the school board, give luncheon club talks on the importance of chemistry and chemists, be a scout leader, write letters to the editors on the chemical errors in the press, etc. We have asked him to make himself known in his community.

I need not tell you that these ac-

**To Research Administrators:** Here is a master key: *Let us see that the chemist gets the recognition and the reward for doing the creative work that society needs, and only he can do.*

tivities are not "natural" activities of the chemist. Rather, they are the activities of the "outgoing" type of individual. So the introverted chemist must force himself to do them. With practice, he can become good at them, but he does need practice. I might add that because of his idealism, the chemist occasionally gets in hot water when he tackles social problems.

Society and the world at large needs technical creative ability as never before. We see more signs of this need for technical creativity. We see efforts at organized creativity, brainstorming, problem solving without thinking, etc. The chemists have an outstanding record of creating because they are good at it. They insist on thinking as they do it, but they do produce good results.

Now if we can ask the chemist to take on all of the civic things that we are recommending, are we diluting his creative chemical efforts? Are we taking time away that could

better be used by the chemist doing the things that come more naturally to him? In the long run, are both society and the chemist better off, if the chemist sticks to his chemistry?

Let us look at another thing that is happening to chemists. It is illustrated by an incident that occurred during an interview with a senior at one of our prominent eastern schools. The senior happened to be a physicist, but the principle still holds. This senior had made one of the finest records ever seen at the college involved. His professors were convinced that he would make an outstanding scientist. The student, however, instead of going ahead taking graduate courses in physics was going to take business administration. Will society be better off for having lost a brilliant physicist and having gained a good administrator?

We know that research has been growing rapidly; and as it grows, it has needed research leaders, group leaders, section chiefs, managers, directors, etc. At the same time, we realize that the more the chemist advances along this administrative road, the less he deals with chemistry. The more he progresses administratively, the less he uses his chemical creativity. He has too many other urgent problems which crowd out chemistry. The industrial management system has been responsible for this. A title with people working for you means "status."

The more people, the more status and the less chemistry. Every administrator in industrial research can tell about losing a good chemist and gaining a poor administrator, by promoting a chemist.

Do not misunderstand me! I am not belittling good technical administrators — they are hard to find. Rather, I am concerned about the chemistry student working on his Ph.D. who said, "Heaven help me if I ever turn out to be a good bench chemist! I will never amount to anything in industrial research."

My story is simple. Let us help the real chemist keep on being a real chemist by not diverting him into channels which do not come naturally to him. Let us help him to do the creative work that society needs. As research administrators, let us see that the chemist gets the recognition and the reward for it. Let us have more "real chemists" in industrial research.

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**Plastics Exposition:** To be held Mar. 18-21, 1957, in Shrine Exposition Hall, Los Angeles, Calif., jointly with the Society of the Plastics Industry's Annual National Conference.

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**Announced:** By Malvern J. Hiler, F.A.I.C., president of The Commonwealth Engineering Co. of Ohio, Dayton, Ohio, the appointment of Dr. William N. Carson, Jr., as technical director.

## Introduction to Dr. Thomas

Dr. J. Bennett Hill

*Recently Retired Director of Research and Development, Sun Oil Company,  
Philadelphia, Pa.*

(Excerpts from remarks made when the Honor Scroll of the Pennsylvania AIC Chapter was presented to Dr. Charles L. Thomas.)

WHILE I have known Charles L. Thomas for a great many years, it has been only the past five years that I have had the privilege of knowing him intimately as an associate. In 1951, I began to try to persuade Charlie that the Sun Oil Company needed and could use his ability and experience. Fortunately, our conversations bore fruit and it was with a great deal of pleasure that I learned from him his decision to fuse his interest with Sun's.

His worth has been quickly appreciated and recognized. After less than a year as a staff assistant on special problems, he was made manager of Sun's research at Norwood. Then in 1953, he became associate director of research and development with the direct responsibility of Sun's research and development program. Very recently, he has become director of the Research and Development Department.

Charlie has brought to his present connection not only his wealth of experience in catalysis and in petroleum technology more broadly, but even more so, his active imagination, his sound and comprehensive scientific knowledge, and his dynamic

leadership. He has refused to allow his administrative duties to overwhelm his scientific thinking, as is shown by more than twenty-five patent applications in his name in the last five years. (We like to kid him about one invention he made which turned out to be exactly anticipated by a patent granted in 1865!)

Charlie has a philosophy of research. He quarrels with the general claim that the purpose of industrial research is to make money. Research, he says, does not make money; instead it creates opportunities for the company to make money. Which ever way you look at it, it is certain that the dollar sign is a very important one in his research thinking. At one of our annual research conferences, some of Charlie's associates once presented him with a machine to make dollar bills. I think maybe it is Charlie's prize possession!

I congratulate Charlie on being singled out for this honor and THE AMERICAN INSTITUTE OF CHEMISTS on their perspicacity. This is a well-deserved recognition of this man's contributions to chemistry and to the chemical profession.

## The Career of Charles L. Thomas

Dr. Alex G. Oblad

*Vice President, Research and Development, Houdry Process Corp., 1528 Walnut St., Philadelphia 2, Penn.*

(Presented when Dr. Thomas received the Honor Scroll of Pennsylvania AIC Chapter.)

I HAVE known Dr. Charles L. Thomas since about 1937. Since that time, I have had reason to follow his career closely. He has made an outstanding record as an industrial scientist and, at the same time, he has worked very energetically and devotedly toward the cause of improving the professional status and economic well-being of scientists and engineers.

Dr. Thomas is a native southerner, having been born in Hendersonville, North Carolina. He obtained his grammar and high school education in Charlotte, N.C. He began his academic training at Erskine College and later transferred to the University of North Carolina where he received the B.S. and M.S. in chemistry. From North Carolina, he moved to the Middle West to attend Northwestern University, where he received the Ph.D. in chemistry.

Dr. Thomas showed an early interest in chemistry. This manifested itself in experimentation in his mother's kitchen. While this proved to be a thrill to him, the story goes that it caused much consternation in the Thomas household! Continuing his experimentation in chemistry in a much more appropriate place, namely, the University of North

Carolina, he had several papers published on organic chemistry and the determination of nickel in steel.

At Northwestern, he worked with Professor Hurd and published a number of papers on the chemical properties of ketene, furan, and ketones. It was while he was attending Northwestern that he met the future Mrs. Virginia Thomas, who was a speech major there.

In 1931, Dr. Thomas joined Universal Oil Products in Chicago where he stayed until 1945. He began as a research chemist and rose to the position of associate director of research. He was fortunate while there to be associated with some of the world's outstanding research people in petroleum chemistry, such as Dr. Hans Tropsch, co-discoverer of the Fischer-Tropsch process; Dr. Gustav Egloff, and Dr. V. N. Ipatieff. Dr. Thomas' work included catalytic and thermal reactions of hydrocarbons with special emphasis on catalytic reforming and catalytic cracking. His contributions at Universal Oil Products Company covered the scientific spectrum from thermodynamic aspects to process engineering. Dr. Thomas has a particular knack of applying fundamental knowledge to a practical problem, making it much



*John H. Nair presenting Honor Scroll to Dr. Thomas. Dr. Bohrer at right.*

simpler to achieve a solution. While at Universal Oil Products Company, a large number of papers and over 100 patents were published as a result of his activities. Such productivity is surely an indication of his contributions to Universal Oil Products Company.

In 1945, Dr. Thomas joined Great Lakes Carbon Company and remained there until 1951 as director of research. While there, he directed research in the chemistry of carbon black and cracking catalysts.

Dr. Thomas holds memberships in many technical and engineering societies and has taken an active part in the affairs of the American Chemical Society, THE AMERICAN INSTITUTE OF CHEMISTS, the American

Institute of Chemical Engineers, American Petroleum Institute, Philadelphia Catalysis Club, and the First International Congress on Catalysis. To mention in detail all of these various activities would be very imposing. In the interest of brevity, it can be said with assurance that no one has worked harder than Dr. Thomas for the benefit of science and the professional status of scientists and engineers.

It is through the activities of such people that the profession of chemistry and chemical engineering has achieved its present status. In the future, any improvements in this field and in the battle to win the race of scientific progress now going on with Russia, Dr. Thomas will surely be in the foreground.

## Presentation to Dr. Thomas

The Honor Scroll of the Pennsylvania Chapter of THE AMERICAN INSTITUTE OF CHEMISTS was presented to Dr. Charles L. Thomas, director of research and development for Sun Oil Company, Philadelphia 3, Penn., at a testimonial dinner on January 10, 1957, in Philadelphia.

Dr. John J. Bohrer, chairman of

the Pennsylvania Chapter, presided. Dr. Alex Oblad, vice president of Houdry Process Corporation, and Dr. J. Bennett Hill, recently retired director of research and development of Sun Oil Company, introduced

Dr. Thomas. The Honor Scroll was presented by John H. Nair, president of THE AMERICAN INSTITUTE OF CHEMISTS. Dr. Thomas accepted the award with an address on "Being a Real Chemist." (See preceding pages.)

The Citation on the Honor Scroll reads:

To  
**Charles L. Thomas**

*For his proficiency in his profession, his contributions to the science of petroleum chemistry and his work toward the advancement of the chemist.*

**Appointed:** John J. O'Connell, F.A.I.C., as marketing vice president of Amoco Chemicals Corp., which is a consolidation of three chemical affiliates of Standard Oil Company (Indiana). He has joined the Chicago offices of Jay H. Forrester, Amoco Chemicals' president-elect, at 910 S. Michigan Ave., Chicago, Ill.

**Received:** By Special Libraries Association, a grant of \$20,350 from the National Science Foundation, to support a Scientific Translations Center at The John Crerar Library in Chicago, Ill. For information: John P. Binnington, Librarian, Brookhaven National Laboratory, Upton, L.I., N.Y.

**Nuclear Instrumentation Conference:** To be held in Atlanta, Georgia, April 10-11, 1957. Dean Joseph Weil, College of Engineering, University of Florida, is director. The meeting is sponsored by the Instrument Society of America, 313 Sixth Ave., Pittsburgh, Pa.

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# The Chemist, the Industry and National Defense

Simon Askin

*President, Heyden Chemical Corporation, 342 Madison Avenue, New York*

(Presented before a joint meeting of the New York AIC Chapter and the Chemical Industry Association, Nov. 8, 1956, at the Belmont Plaza Hotel, New York, N.Y.)

AFTER two international conflicts during the past fifteen years, we are acutely aware of the need for continued preparedness. Being prepared is no longer the job of a small group of professionals. In these days of total war, victory in battle requires the utilization of every element of our national strength. Our talent for mass production is perhaps our best known asset, but quality, too, is extremely important, since second-best weapons can mean defeat.

A vigorous, well-planned research and development program is the key to quality and an essential element in any sound security system. It cannot be "tooled up" like a manufacturing process to produce under emergency conditions. The dynamic world of our time demonstrates why we cannot allow our military-related research and development to lag.

Today we live with fantastic technological progress which creates a sense of emergency with each new crisis. Vast new regions have suddenly begun to play vital roles in the international scene. In Asia, waning colonialism and growing nationalism are setting the stage for an awaken-

ing Africa. International Communism is quick to exploit each episode. Our leaders are aware of this trend. Since the enunciation of the Truman doctrine in 1947, they have confronted world events in the light of their impact upon the struggle between the free world and international Communism. Up to 1941, almost all events of international impact were confined within an area in Europe of some 600-miles square. We must now interpret and react to news from all corners of the earth. With the imminent prospect of man-made satellites and rockets to outer space, our horizons may be in for further broadening. Though a trip to Mars is not immediately probable, scientific inquiries do give a graphic indication of the exponential nature of many technological developments of our times.

If another war should occur, only our currently still-superior technological development will allow us to prevail, despite the overwhelming manpower advantage of a potential foe. A major segment of this development is the growth of the chemical industry. Ever since 1802, when du Pont began the manufacture of

black powder, chemicals have been in the forefront of scientific achievement and of major importance to national defense.

One of the reasons for our industry's growth is that it spends annually almost 4 per cent of its sales dollar on research. The resulting process improvements and new products have brought us (1955 figures) to the point where we are responsible for 42% of the world's chemical production. This is three times the Soviet Union's, four and one-half times Great Britain's, and seven times West Germany's chemical production. According to the Department of Commerce, chemical manufacturers' sales rank sixth among the manufacturing industries, or about 24-billion dollars in 1956. Our industry has been growing three times faster than the rest of American industry. The dynamic nature of this expansion is shown by the estimate that over 40% of sales by the chemical industry are for products that were not even known fifteen years ago.

The chemist's contribution to the potential for modern warfare is so important that just about every product of our industry can find its special role in defense. The most direct application is the satisfaction of the prodigious military appetite for explosives as in artillery shells, rockets, rocket propellants, mines, incendiaries, and in construction operations. There is a tremendous variety

of other uses for chemical products. For example, it takes about 200 chemical products to outfit an infantry unit; 2000 to launch a battleship. There are 100 applications of reinforced plastics in the F-86 jet.

The chemist did a magnificent job in providing the United States with a billion-dollar synthetic rubber industry within two years after our rubber supply was cut off by the Japanese in 1941. The general public is familiar with the importance of infantry mortars and Napalm in Korea. It is aware that transparent aircraft turrets are plastic products of the chemical industry. However, the less glamorous, though persistent campaign to produce stronger, tougher, faster and lighter-weight weapons is not so widely known. Special alloy steels, to withstand the terrific heat and pressures inherent in the operation of jet engines, are produced by alloying metals such as chromium, nickel, tungsten and vanadium—an essential link provided by chemical research in the advancement of jet engines.

More recently, a fluorocarbon plastic solution has been used as a lubricant for bearings and valves. It is chemical-resistant and will not wash out with water. A plastic-coated glass yarn creates a product with greater abrasion and corrosion resistance to protect cables for aircraft and naval applications. A chemical radiation detection kit has been developed by the Chemical Corps.

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Additional alloys for jet engines, rockets and guided missiles are being developed each day. These developments with military applications are proceeding on an expansive front which covers about every phase of the chemical industry.

The diversity of uses of chemicals in national defense is not readily predicted. For example, pentaerythritol is a chemical used extensively in the manufacture of protective coatings, both civilian and military. Its nitration grade is a raw material for explosives and an intermediate for the synthesis of pharmaceuticals and plasticizers. The latter are utilized in the manufacture of a whole series of plastic materials. Its close chemical cousin, trimethylethane, will be used in the manufacture of polyurethane, foamed-in-place, resins to provide lightweight structural strength in aircraft parts. The myriad uses of such a product indicate the building-block nature of the individual chemical.

The chemist has also played a major role in the atomic energy field. In the Manhattan Project, chemists developed the analytical and refining methods needed for the production of fissionable materials. Recently, the Atomic Energy Commission has begun to open this broad area to private industry, and has asked it to produce uranium tetrafluoride and hexafluoride. These products are a step in the preparation of uranium oxide, and require purity equivalent to pharma-

ceutical standards. Over thirty firms expressed an initial interest. Soon a major sector of the chemical industry will be heavily involved in commercial applications of atomic energy.

A new problem for the chemist will be to find a use for the plutonium, itself fissionable, produced by atomic reactors. Because it is extremely poisonous, the chemist will have to determine how to handle it and how to burn it for power. Atomic power, to compete with other power sources, must have the best possible chemical processing developed for it. The AEC suggests that chemists join a broad program investigating high-temperature systems on an unclassified basis, in the hope of developing materials for such chemical processing.

Recently the Air Force announced that contracts have been given to private industry for development of supersonic aircraft to be powered by high-energy chemicals rather than petroleum or nuclear fuels. A high-energy chemical is militarily attractive because it yields greater heat energy than conventional fuels and provides greater range and speed. Such a fuel may also be of greater military interest than nuclear fuels, which require heavy lead shielding. The chemical potential for this use in national defense offers another challenge to our industry.

How shall the chemist and his industry be ready on a moment's notice to produce all the essential

materials needed in a national emergency? This is obviously impossible; the need cannot be fully anticipated. It would be wasteful to produce for the civilian market the vast quantities of materials needed for war. What we can do is to be prepared for speedy mobilization.

Therefore, the chemical industry must be ready with the productive capacity and technology needed, so that actual mobilization will largely be a conversion from non-essential to essential end uses for its product. In total war, we might have to triple our currently high production. Since this much extra capacity cannot be maintained in idleness, we would have to be ready for an additional expansion of chemical production facilities.

The industry must make its vital role in defense known to the public and its political representatives so that a climate favorable to the steady growth of the chemical industry can be maintained. Lastly, the industry itself must periodically replace its obsolete facilities and vigorously maintain its research and development programs.

I shall comment on some of the important factors which would create this favorable climate for the maintenance of a chemical industry prepared for mobilization.

#### The Tariff Problem

After World War I demonstrated the need, our chemical industry came of age under necessary tariff protec-

tion. Since World War II, to bolster the economies of Western Europe and Japan, we have cut our tariffs several times. The last revision permitted an added cut of up to 15 per cent, with 50 per cent reductions on some items. Just when will we reach the danger point, particularly for our industry? Chemical wages in Western Europe generally run from 40 to 60 cents an hour. Many of these chemical manufacturers are cartels which enjoy numerous forms of government help not encouraged in this country. Currently, our chemical manufacturers are paying wages of well over \$2.00 an hour. These rates are also reflected in salaries, construction, and raw material costs. We delude ourselves, if we believe that we are such efficient producers as to be able to completely overcome this severe handicap. The inevitable consequence of this disadvantageous competition will be the reduction of relatively narrow profit margins and of funds available for research and development, which, in the long term, could be disastrous.

The tariff issue has been with us since the days of Daniel Webster and John C. Calhoun. It has recently presented itself under such titles as Organization for Trade Cooperation, General Agreement on Tariffs and Trade, customs simplification, and the anti-dumping and escape clauses of the current law. It is sold to the public by use of

catch phrases, such as "Trade Not Aid" and "Closing the Dollar Gap."

Last Spring, a Customs Simplification bill was enacted which fails to simplify administration of the law, but does, in effect, further reduce tariff rates. The authorization to join OTC, which would permit further destruction of our tariff structure by another international compact, without Congressional approval, was tabled in committee. It will probably soon be revitalized for a second try at passage.

Our national defense cannot be allowed to become dependent upon chemical sources west of the Rhine River or in Great Britain. These areas could be quickly overrun or cut off by a potential enemy. How can we readily mobilize with vital segments of our industry missing because we have become so dependent upon distant countries? Indeed, it is a serious question whether the diversity of end uses of our industry's products will permit any substantial segment to be classified as not vital to national security.

A specific example may illustrate this perplexing issue. Progressive duty reductions on para aminosalicylic acid, which totalled about 75% during the years 1950-55, resulted in an increase in imports from 28,000 pounds in 1951 to 250-million pounds in 1953. Thus, in 1954, we were dependent upon foreign material for over 40% of this vital drug. As a result, U.S. producers

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have been forced out of the market until only one survives. That company applied for tariff assistance under the "Escape Clause" of the tariff law. It showed the threat of further injury from foreign competition and of possible extinction. Its application was denied, presumably upon advice of the State Department.

This issue is likely to be with us for many years. You can, through contact with your elected representatives and through support of your professional and industry associations, emphasize the special nature of the chemical contribution to National Defense. If this is successful, ultimate tariff decisions will be made by an informed Congress and electorate who have got beyond the platitudes and down to the specifics of this issue.

#### The Depreciation Problem

Another thorny problem for our industry stems from its extremely high plant and equipment costs and exceedingly rapid rates of obsolescence. The amounts of depreciation set-asides available for the chemical industry's replacement requirements

have fallen short, by many millions of dollars each year, of the inflated replacement costs of such facilities. At the current high rate of corporate income taxation, this creates an unduly heavy burden for retained earnings and new financing. The 1954 Amendment to the Internal Revenue Code provided additional latitude for industry in the use of various methods of accelerated depreciation. Certificates of Necessity permit additional accelerated depreciation on new facilities for the production of vital materials which the Office of Defense Mobilization regards as below desired national capacity. While this tax consideration has been helpful, Congress has not come to grips with the basic problem of heightened replacement costs.

#### The Manpower Problem

Another aspect of a favorable climate for mobilization is the availability of qualified manpower needed to operate our economy with its continuing pace of progressive technological development. Since World War II there has been partial appreciation of this problem at the national level. However, the program has not developed momentum until recently.

The Selective Service System has lately reflected the results of extensive efforts by private industry to dramatize the immediate significance of the shortage of technically trained men. Each state has set up Advisory

Committees to Local Draft Boards. The Committees are consulted as to the desirability and need for granting individual deferment requests for scientific personnel. The Reserve Forces Act of 1955 has been implemented to permit men with critical skills to enlist in the Six-Month-Training Program which originally was a part of the Universal Military Training concept. These represent substantial strides by our Government and by public opinion toward the realization that highly trained technical men are far more effective in serving the national interest in industry, rather than in unrelated work in military service.

It is estimated that one-third of America's scientific research and development is directly concerned with problems of national defense. Russia's is thought to be almost entirely committed to such effort. The British Association for the Advancement of Science states that a little less than two-thirds of their scientists are so engaged.

The Russians are reportedly turning out more engineers and scientists than we are. Rather than operate our country with the purpose of outdoing the Russians statistically, we ought to determine whether we shall be able to meet the projected needs of our own economy. According to a recent survey, we will be short 457,000 scientists and engineers by 1965. The chemical industry alone

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would be short some 93,000. Such a situation could result in a gradual slowdown in the technological development of our civilian economy and in national defense.

The chemical industry, through the Manufacturing Chemists' Association, has launched a million-dollar, 5 year plan to promote the interest of young people in science as a career. Individual companies are participating through radio and television programs stressing the need and opportunities offered in science.

Public relations methods are useful in promoting chemistry as a career, but there are more effective approaches. The first concerns the contribution toward attracting and developing career scientists offered by our schools, colleges and universities. The problem is illustrated when we consider the case of the high school chemistry teacher. Last year, according to the U.S. Office of Education, we were short 140,000 teachers. The Ford Foundation indicates that instead of increasing the caliber and number of high school teachers, we are failing even to replace those departing from the profession. From 1950 to 1955, the subject area which had the greatest decline in the output of new high school teachers was "Science," with a decline of 57%. In the 1954-55 school year the estimated number of science teachers needed was 7900 and the qualified

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teachers produced totalled only 3600. Most indicative of the basic problem is the fact that of these only 1700 new ones entered teaching.

The National Education Association has just released current figures on salaries for college and university faculty members. They show the average income to be \$5,243 per year. A college president averages \$11,300; a full professor, \$7,000. Such salaries are hardly enough to attract and retain sufficient superior teachers.

Our teachers' primary need is a salary structure high enough and flexible enough to compete effectively with other fields bidding for technical manpower. In the 1930's, six of every ten new Ph.D.'s entered college teaching. The projected figure for 1970 is two out of ten. Our teachers also need prestige and status comparable to other professions in the community. The teacher's job should be better organized so as to challenge and utilize the interest and ability of talented people.

### What Individual Chemists Can Do

Some of these objectives can be met through participation by each of us as responsible citizens in P T A groups and by supporting a better salary structure for teachers, through the polls, through consideration of local government budget policies, and by state or federal legislation.

It is no accident that science should be hardest hit by this decline. There has been a profound decrease in the number of students of chemistry since World War II. Recognizing the critical need, the AEC has announced a program of national fellowships for the study of physical sciences and nuclear engineering. These fellowships, about 150 annually, grant \$1800 per year plus tuition and dependency allowances. Previously, fellowships in radiological physics and industrial hygiene had been established. Such fellowships are an encouraging indicator of the awareness of our personnel problem.

Chemists must take it upon themselves to see that they are replaced by an equally able, enthusiastic and more numerous group of new chemists. The chemist in the course of his career in corporate management or in professional associations must foster the concept that assistance by the chemical industry to higher education is in its own self-interest and is no longer to be regarded as a philanthropy.

The final approach is a direct attack on the problem. We in industry could go a long way in easing this shortage through direct encouragement of youngsters to embark upon a career in chemistry. As professional men, you are consulted by your neighbor's youngsters and your own for career guidance and advice on the selection of courses. It would help immeasurably if the chemist were as zealous and enthusiastic in his recommendations in this respect as a couple of the other professions.

Within the chemical industry we share an obligation to make the most efficient and economical use of our technically trained personnel. In research departments, industry should use its scientific personnel within the field of their specialty. Research projects should be periodically reviewed so as not to spend efforts on projects which are yielding dwindling results.

This does not mean that basic research effort be limited. Quite the contrary, by enlightened review of our research programs, we should be able to find even more time, money, and manpower available for the encouragement of basic research. In determining which research projects to continue, emphasize or terminate, no one is in a better position to do so than the objective chemist or the market researcher.

### Public Relations

An essential element in the maintenance of a healthy chemical indus-

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try is a favorable attitude of an understanding public. The average citizen seldom comes in contact with process chemicals, though he knows the names of a few of the industry's glamour products. He thinks of the chemical contribution to national defense as explosives and poison gas. He regards the industry as a dangerous place to work, even though the facts prove it to be one of the safest. He may believe that the industry is run by profiteers who put artificial and dangerous substances in foods and drugs. He often attributes the pollution of fishing streams or the atmosphere to our industry.

Vigorous smoke abatement measures and careful disposal of plant effluent are important factors in any effort to influence the public attitude. You can contribute greatly to this public relations conversion through your daily contacts and through professional societies. The industry can help with advertisements in periodicals of general circulation and by encouraging such activities by the industry associations. The average citizen needs to be told the story of how chemicals are playing substantial roles in the satisfaction of human needs while contributing to our national defense.

If we can convince the public and its government officials that our industry is a basic national asset, that will go a long way toward the creation of favorable conditions for an

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industry prepared for quick mobilization.

### Government - Industry Relations

The final aspect of this favorable climate is Government-Industry relations. The U.S. Government cannot be overlooked as a customer since it is the world's largest single buyer of machinery, equipment, supplies and services. The usual channel of communication between it and industry is through Federal Procurement Agencies.

In recent years the various military procurement authorities have been subject to continual careful organizational study and realignment. In the Department of Defense, integration of the Armed Forces has brought about a more standardized application of material procurement and usage. Some may not know of the extreme helpfulness of the Small Business Administration in unravelling the oftentimes still bewildering maze of procurement procedures. It likewise is a source of advice on Federal materiel and supply requirements. Its "U.S. Government Purchasing Directory," currently lists

the procurement agencies of the Federal Government, and includes a product index indicating which agencies purchase what items, and gives advice on selling the Government.

The Department of Commerce daily publishes the "Synopsis of the U.S. Government Proposed Procurement Sales and Contract Awards," which may serve as an indication of the availability of subcontracts. Two guidepost publications may be of interest, "How to Sell the Department of Defense" and "Purchased Items and Purchasing Locations of the Department of Defense." They can be obtained from the Superintendent of Documents for a nominal price. Each of the Technical Services, the Chemical Corps, Ordnance, Quartermaster, Signal Corps, Engineers, and Medical, have their own departments for the development or procurement of specific material, but there is a basic similarity of each procurement activity.

The Chemical Corps offers a good example of how these Technical Services function. The Corps' mission is to develop chemical, biological and radiological agents for use in war. It provides the agencies of the Department of Defense (the Army, Air Force, Navy, and Marines) with the means of defending themselves against chemical and biological weapons. It coordinates in these functions with Civilian Defense and the U.S. Public Health Service. Through

its six procurement districts, materials are obtained. The principal procurement office is located in New York. The latest listing of items of immediate production interest to the Corps includes over 150 chemical materials, which are used in the production of Napalm; the blister, nerve, tear, and choking gases; gas masks and impregnated protective clothing; smoke screening agents; markers and flares; detection devices for gases and radiation; explosive charges in fuses, and many others.

Two years ago the chief chemical officer, the military head of the Chemical Corps, set up a committee of four prominent business and professional men to undertake a study of the Corps' organizational and operational structure. The recommendations of this group, known as the Miller Committee, have largely been implemented. The Corps structure now bears a striking resemblance to an industrial organization. It has the equivalent of a vice president for each of its commands, which include the Research and Development Command; Engineering; Plans and Doctrines — embracing personnel, training, and planning; and the Materiel Command which controls production and purchasing.

The Research and Development Command carries on its own procurement for its Chemical Warfare Laboratories and its Biological Warfare Laboratory, both in Maryland, and for the Dugway Proving Ground

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in Utah. The commanders of these installations hold Ph.D. degrees. About 5000 civilians are employed, 30% of whom are professional personnel. Half of the 260 officers and 1600 enlisted men here assigned are professionally trained. The Corps contracts to others about 25% of its research and development effort. The problem is to locate those organizations or individuals best qualified for a given task. The Research and Development program encompasses basic and applied research, design and development work, and experimental and mass production on a limited scale for user tests.

The Corps, too, has the problem of attracting and holding qualified technical manpower. It is difficult to compete with industry salarywise. However, its scientists do have the satisfaction of working on challenging problems of direct importance to national security. Freedom to publish non-classified research is generally recognized. Professional status is enhanced by a liberal policy about attendance at scientific meetings.

The Chief Chemical Officer is eager to combine the best of civilian and military talents in the operations of the Corps. Dr. Per K. Frolich, formerly with Merck & Co., was made Deputy Chemical Officer for scientific activities. Two of the four people associated with the Chief Chemical Officer organizationally are civilians. Civilian deputies are the

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rule in the Research and Development Command.

The Materiel Command has formed an Industrial Mobilization Division to work with industry, another indication of Corps' awareness of the need for better Government-Industry relations for effective mobilization.

Another development was the formation of the Chemical Corps' Industry Advisory Groups. In this, the Corps sought the aid of the Armed Forces Chemical Association. A 26-man council of industrial leaders and committees of specialists were set up for advice on problems relating to the fields of interest of the Corps' mission.

One of the best answers to our need for public understanding of economic mobilization is provided by the Department of Defense through its Industrial College of the Armed Forces, which conducts a training program for members of the Armed Forces and also for business and industrial leaders. This program is designed to acquaint both the military and civilian personnel with the prob-

lens of mobilizing the Nation's economy for defense. In addition to resident instruction at Fort McNair, Washington, D.C., the College each year conducts short courses in industrial preparedness in major cities, which are open to reserve officers of the Armed Forces and to selected civilians from business, industry and labor. This year such a course is to be given May 6-17th, in New York, N.Y. You would be well-advised to consider attendance at these courses. The subject strikes at the heart of the industrial mobilization problem.

The individual scientist in industry can play a significant role in the shaping of world events. If enough individuals perform the same constructive functions, on their own or through organizations such as the Chemical Industry Association or the AIC, the total effect cannot but be far-reaching.

If the next fifteen years exhibit the same dynamic potential as the past fifteen, we will have to more actively participate in promoting the needs of mobilization, if we are to survive. If we succeed in the establishment of a healthy American industry, ready for every eventuality, this will confront any would-be aggressor with the greatest deterrent force.

Potential strength alone is not enough. Future aggression may come with treacherous suddenness and blinding speed. We must have a

highly mobile, well-equipped Armed Force of such strength, commensurate with our national economy, as to perform its military purpose without injuring our economic balance. In this way the United States can maintain its free economic and political institutions and look with confidence toward the future.

"The chemical industry has shown an impressive growth curve during the past quarter of a century, having expanded an average of 10 per cent per year, compared to an overall industry average of a 3 per cent annual increase. It should therefore be able to face any fluctuations with considerable equanimity."

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## AIC Activities

### Chicago Chapter

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### Brainstorming Techniques

The Chicago Chapter is meeting March  
14th at the Chicago Engineers Club, to  
hear John Schneider, patent attorney and

trade mark counsel for the Abbott Laboratories, speak on "Some Practical Aspects of the Brainstorming Technique." Mr. Schneider is in charge of brainstorming for his company. He obtained the B.S. and M.S. degrees from Washington University of St. Louis, and legal training from the Missouri Institute of Accounting and Law. Previous to his present employment, he had been associated with Western Cartridge Co. as research chemist and patent agent, and with Monsanto Chemical Co. as patent attorney. He is the author of both scientific and legal publications.

### From the Newsletter

The following items are from the *Newsletter* published by the Chicago Chapter:

**Group Insurance Through Technical Societies:** The problem of older chemists who have recently changed jobs, being unable to obtain group insurance through their employers' benefit plans, has been brought before the Chicago AIC Chapter Council. The New York AIC Chapter has an extremely attractive Group Insurance Program currently in effect, and well over 150 chapter members are participating. Some of the features of their plan are: Weekly sickness and weekly accident indemnities (\$75.00 per week for 2 years for sickness and as long as 5 years for a disabling accident when the annual premium is \$88.00), indemnity for medical treatment of minor injuries, accidental death indemnity and daily hospital and surgical operation indemnity benefits.

The plan can be canceled only because of non-payment of premiums; when the insured becomes 70 years of age; if the insured retires or ceases to be engaged in the profession, or if the Insuring Company declines to renew all similar policies in the insured group. Full coverage can be obtained to age 70, and house finement is not required.

This plan should be of extreme interest to some of our chapter members and prospective new members. Interested parties should contact the Chapter officers for more detailed information.

### Personnel Notes

**Dr. Roy C. Newton,** Hon. AIC, vice president of Swift & Co., Chicago, has been selected to receive the 1957 Gold Medal of the AIC. The medal is being given for Dr. Newton's tireless service to the chemical profession and for his leadership in food technology. The Chicago chapter members should be especially pleased that one of their group has been so highly honored.

**Dr. Edmund Field,** Chicago AIC Chapter Chairman, has been promoted to Senior Research Associate by Standard Oil Co. (Indiana).

**Dr. Lewis A. Gist, Jr.**, after receiving his doctorate from Iowa State College, has accepted appointment as head of the Department of Chemistry, Virginia Union University, Richmond, Virginia.

### New York Chapter

*Chairman, Dr. Murray Berdick  
Chairman-elect, Dr. Ernest I. Becker  
Treasurer, Shepherd Stigman  
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Sugar Research Foundation,  
52 Wall St., New York 5, N.Y.  
National Council Representative,  
Richard L. Moore*

### Young Chemists' Meeting

The New York Chapter will meet April 4, 1957, at 8:00 p.m. at New York University, Washington Square, East Building, Green Room, to hold its Annual Young Chemists' Meeting. The theme is "How to be a Success in Chemistry." Speakers will be Dr. Charles G. Overberger, F.A.I.C., head of the Department of Chemistry, Polytechnic Institute of Brooklyn, on "The Function of a Scientist in the Chemical Profession"; and Dr. Raymond W. McNamee, manager, Research Administration, Union Carbide and Carbon Corporation, on "Helpful Innate and Acquired Characteristics for Chemists." A discussion period and refreshments will follow the meeting.

### Washington Chapter

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Wesley R. Koster*

### Trends in Curricula

At the January 15, 1957, luncheon meeting of the Washington Chapter, Dr. Charles R. Naeser, head of the Department of Chemistry, George Washington University, described trends in the current curricula of chemistry courses in colleges and universities. Among other things, the emphasis appears to have shifted in recent years away from highly intensive training in undergraduate courses to a more generalized approach wherein methods and principles rather than technical proficiency are stressed. This is said to be feasible because of the widening reliance upon instrumentation.

## AIC ACTIVITIES

### New Jersey Chapter

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*Secretary*, Dr. John F. Mahoney,  
1000 Woodmere Drive, Westfield,  
N.J.

*Treasurer*, Dr. Curt Bamberger  
*National Council Representative*,  
Dr. Cecil L. Brown

#### Dr. Bronk to Speak At Honors Meeting

The New Jersey Chapter will meet at the Military Park Hotel, Newark, N.J., on May 3, 1957, to present its Honor Scroll to Dr. Herbert W. Mackinney of the Bakelite Division of UCC, Leon R. Joslin of Standard Oil Company, and Chester A. Amick of American Cyanamid Company. These three as the Cooperating Committee of the New Jersey Chapter, and W. L. Davidson of the Thomas Jefferson High School, Elizabeth, N.J., advisor, helped in planning a new science building and facilities for the State Teachers' College at Montclair.

Dr. Detlev W. Bronk, president of the National Academy of Sciences and of the Rockefeller Institute, will be the guest speaker. Student medals will be presented to outstanding seniors in New Jersey colleges.

All AIC members and guests are invited to attend this honors meeting and dinner. A reception at 6:00 p.m. will be sponsored by the three companies whose scientists are being honored. For reservations, Dr. F. A. Lowenheim, Program Chairman, P.O. Box 471, Rahway, N.J. (Fulton 1-3000).

### Pennsylvania Chapter

*Chairman*, Dr. John J. Bohrer  
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International Resistance Corp.,  
401 N. Broad St., Philadelphia 8, Pa.  
*National Council Representative*,  
Marcus Sittenfeld

#### Professional Aspects

The Pennsylvania Chapter is meeting March 7, 1957, at The Engineers' Club, 1317 Spruce St., Philadelphia, to hear Clarence H. Evans, Senior Consultant, Chemical Engineering Section, E. I. du

Pont de Nemours Co., and chairman of the Delaware State Board of Registration for Professional Engineers, speak on "Professional Aspects of Chemistry and Chemical Engineering."

### Will You Come

**April 4, 1957.** New York Chapter. Annual Young Chemists' Meeting. 8:00 p.m. New York University, Washington Square, East Building, Green Room. Theme: "How to be a Success in Chemistry." Speakers: Dr. Charles G. Overberger, F.A.I.C., head, Department of Chemistry, Polytechnic Institute of Brooklyn, "The Function of a Scientist in the Chemical Profession." Dr. Raymond W. McNamee, manager, Research Administration, Union Carbide & Carbon Corp., "Helpful Innate and Acquired Characteristics for Chemists." Discussion Period. Refreshments.

**Apr. 23, 1957.** Washington Chapter. Award of Honor Scroll to Dr. Milton Harris. Details to be announced.

**May 3, 1957.** New Jersey Chapter. Annual Honors Dinner and Meeting. Military Park Hotel, Newark, N.J. Cocktails, 6:00 p.m. Dinner 7:00 p.m. Meeting 8:00 p.m. The Chapter's Honor Scroll will be presented to H. W. Mackinney of the Bakelite Co., Leon R. Joslin of Standard Oil Co., and Chester A. Amick of American Cyanamid Co., for their work on the Cooperating Committee of the Chapter in connection with the new science building and facilities for the State Teachers' College at Montclair, N.J. Student medals will be presented to outstanding students of the area. Speaker: Dr. Detlev W. Bronk, president, National Academy of Sciences and Rockefeller Institute. For reservations: Dr. F. A. Lowenheim, Program Chairman, P.O. Box 471, Rahway, N.J. (Fulton 1-3000).

**May 3, 1957.** Chicago Chapter. Speaker, Dr. Henry B. Hass, president-elect of the AIC and president, The Sugar Research Foundation, New York, N.Y. For information, write Secretary of the Chicago Chapter.

**May 22, 1957.** National AIC Council and Board of Directors. Dinner Meeting, Sheraton-Mayflower Hotel, Akron, Ohio.

**May 22-24, 1957.** Thirty-fourth Annual Meeting, THE AMERICAN INSTITUTE OF CHEMISTS. Sheraton-Mayflower Hotel, Akron, Ohio.

**June 6, 1957.** New York Chapter. Honor or Scroll Award meeting. Program to be announced.

**April 10-11, 1958.** Thirty-fifth Annual Meeting, THE AMERICAN INSTITUTE OF CHEMISTS. Los Angeles, California. Host: The Western AIC Chapter.

**May 14-15, 1959.** Thirty-sixth Annual MEETING, THE AMERICAN INSTITUTE OF CHEMISTS, New York, N. Y. Host: The New York and New Jersey Chapters.

#### For Record:

#### Meetings in March

**March 7, 1957.** Pennsylvania Chapter. Dinner. The Engineers' Club, Philadelphia, Pa. Speaker, Clarence H. Evans, senior consultant, Chemical Engineering Section, E. I. duPont de Nemours & Co., and chairman, Delaware State Board of Registration for Professional Engineers. Subject: "Professional Aspects of Chemistry and Chemical Engineering."

**March 11, 1957.** New York Chapter. Presentation of Honorary AIC Membership to Lawrence H. Flett, formerly AIC president. Acceptance Address: "Pursuit of Invention." Place: Hotel Commodore, New York, N.Y. Dinner. Reception sponsored by Allied Chemical & Dye Corp.

**March 14, 1957.** Chicago Chapter, Chicago Engineers Club, Chicago, Ill. Dinner meeting. Speaker, John Schneider, patent attorney and trade mark counsel, the Abbott Laboratories. Subject, "Some Practical Aspects of the Brainstorming Technique."

**March 28, 1957.** Western Chapter. Dinner and meeting. Los Angeles, Calif. Presentation of Honorary AIC Membership to Dr. Joel H. Hildebrand, by AIC President Nair.

## Opportunities

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**Junior faculty member** New York area college, F.A.I.C., wishes summer position—June, July, August. Extensive research and supervisory experience. Box 30, THE CHEMIST.

**Analytical Chemist**, F.A.I.C., desires position in smaller city in Midwest. Ten years' experience in developing analytical methods, mostly in organic materials. Several publications. Experience in administering analytical control department. Box 32, THE CHEMIST.

**Chemical engineer**, F.A.I.C. Expert on chemical tariffs. Experience in customs chemistry. Box 34, THE CHEMIST.

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**Chemist**, as group leader in research and development of additives (plasticizers, stabilizers, etc.) for vinyl and other plastic materials. Ph.D. preferred with some background in area indicated. Please include resume and salary requirement. Box 31, THE CHEMIST.

**Engineers** Wanted by U.S. Naval Station and U.S. Naval Repair Facility, San Diego 36, Calif. GS-9 at \$6115. to GS-12 at \$7570 annually.

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## Raymond E. Kirk 1890 - 1957



(Resolutions, prepared by Dr. Donald F. Othmer, F.I.I.C., and Karl M. Herstein, F.I.I.C., adopted by the National Council.)

All too infrequently a man appears who possesses in superabundance the qualities which arouse among his fellows the admiration and affection which all of us prize.

Raymond Eller Kirk was such a man. By his wisdom in our Council, by his friendship, which he gave lavishly, by his scholarship and his sheer human warmth, association with him has been a lasting benefit to all of us. His high ideals of professional conduct, his lifetime's work in professional education, his monumental contribution in the *Encyclopedia of Chemical Technology* will always shine for us.

As chairman of the New York Chapter of The American Institute of Chemists, as a National Councilor for many years, as a tireless worker on various committees, The American Institute of Chemists stands in his debt.

Be it therefore resolved, that the Council of The American Institute of Chemists at its meeting February 13, 1957, expresses its deep regret that Raymond Eller Kirk will no longer be with us in this world, and

Be it further resolved that a copy of this resolution be sent to his widow, Mrs. Beth Sibley Kirk, as an expression of our sympathy, and that a copy remain in the permanent files of The American Institute of Chemists.

### Raymond E. Kirk

(*Resolution From The Chicago AIC Chapter, transmitted by Dr. Edmund Field, Chairman.*)

It has come to our knowledge that Dr. Raymond Eller Kirk left this world on February 6, 1957.

For many years, we know that Dr. Kirk has been a stalwart worker for chemists and chemical engineers in particular, and for the advancement of people in general. He was a man of great intelligence, magnanimous in his desire to assist in the friendship of people for people. He was a distinguished educator which was acknowledged last year by the American Chemical Society in granting him the A.C.S. Award for Chemical Education. He was a great teacher and was loved and revered by the faculty, alumni and students of the Polytechnic Institute of Brooklyn. He was a great administrator in the field of advanced education. He was a God fearing man with family ties and a lovely family which he cherished more than anything else.

He was a real friend to many people and for many reasons. His was the type of friendship that could always be counted upon in good times or bad.

He spent many hours in thoughtful and objective contributions to the American Institute of Chemists and served on many committees and as a councilor and national officer. He always made an indelible and positive impression on scientific matters of importance in any professional position with which he was connected.

Because of these outstanding qualities of Raymond Eller Kirk, the Chicago Chapter AIC offers the following resolutions:

Whereas, Raymond Eller Kirk was a man of the highest qualities as a scientist and as a citizen and,

Whereas, he made unusual worthwhile

contributions to the development of chemistry and scientific education in this country and,

Whereas, he for many years served with high esteem as head of the Department of Chemistry at the Polytechnic Institute of Brooklyn and more recently as dean of the Graduate School of the same institution and,

Whereas, he made a lasting contribution as the co-editor of *Encyclopedia of Chemical Technology*;

We herewith wish to record our sincere appreciation for having known such a distinguished scientist and exceptionally good man who was able to do so much in his lifetime for many people and in many ways, especially for the up-building and perpetuation of The American Institute of Chemists and all of its Chapters . . .

### The Death of a Friend

The passing of Raymond Eller Kirk removed from our midst a real friend—an unusually splendid man. His was a friendship of positive demonstration and of mutual help and inspiration since we first met during World War I in 1918. He was an invaluable friend to many people in many ways, but to me he was the shining example of a strong, dependable, thoughtful, kind and courteous friend that we are always seeking but very seldom find.

Science, too, has lost a sturdy champion of Chemical Education—THE AMERICAN INSTITUTE OF CHEMISTS and the American Chemical Society, one of its most outstanding and respected members. The Polytechnic Institute of Brooklyn, the alumni and students, can never forget him for his significant contributions to them as an excellent teacher, a marvelous administrator, an expert in human relations, an unforgettable scientific editor.

Dr. Kirk was the epitome of a strong character with an indomitable will for good in a selfish and fearsome world where most men are afraid to stand up for the rights of people and the dignity of the individual.

He stood for right; his loyalty to his friends never wavered, his enthusiasm was inspiring. He completed a magnificent job as a real friend, as a scientist,

as a citizen. We will remember Raymond Kirk with fond regard and deep appreciation through our lifetime for he was the kind of man you can never forget.

—Dr. Lloyd A. Hall, F.A.I.C.

### Personal Tribute to Dean Kirk

(From the New York AIC Chapter)

Raymond Eller Kirk was friend, colleague, mentor, and advisor to most of us.

His rich and full life as scientist, educator, editor, and citizen will continue to serve as an example of an outstanding professional career in chemistry.

Our lives are richer for having known him.

### In Appreciation

May we record our grateful memory of Dr. Raymond E. Kirk, who for many years generously contributed the time necessary to review our annual summary of chemical developments, appearing in the *World Scope Yearbook*, to assure that the information thus given to the public was scientifically accurate.

—William Hendelson  
*Editor*

### From Washington, D.C.

The Washington Chapter of the American Institute of Chemists has learned with deepest regret of the passing of Dr. Raymond E. Kirk.

We extend our deepest sympathy

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## Communications

### About the AIC

To a Critic:

I have studied your letter rather carefully and interpret it to contain two questions: No. 1, Why is such a large proportion of the membership of the Institute in the Fellow level? No. 2, Why is the rate of growth of the Institute so low? A third question might possibly be extracted: Why do a number of Associates and Members remain in their grade instead of progressing to higher grades of membership after a suitable length of time?

The "argumentum ad hominem" is recognized as a common fallacy. Nevertheless, I recall one man who was qualified for admission to the Institute more than thirty years ago but became a member only in 1955. In other words, as members of the chemical profession are trained at present, many years of mellowing are required before they become professionally conscious to the point that they are impelled to join THE AMERICAN INSTITUTE OF CHEMISTS. This is a problem of which all the workers in the AIC have been aware for many years and which they are trying their utmost to combat. It seems to stem from the point of view inculcated in the colleges to some extent, so that a new generation of college teachers will be required before the situation can change in too great a degree. In the meantime, some heads of Chemistry Departments are aware of the situation and preach professional consciousness and pride to their students. The New York Chapter of the Institute for a number of years has made efforts in the same direction; so has the Chicago Chapter. These efforts will all continue to be strengthened as more workers become available.

Regarding the rate of growth of the Institute, there are two factors which have kept it at a low level. One is the lack of professional consciousness among young chemists entering the profession. They ask, "What will membership in the Institute do for me" and they do not accept the overwhelming truth of the answer that they will get out of membership in the Institute what they put into it, and that if they participate in the Institute's activities their reward in

friendship, in professional consciousness and standing will be great, while if they pay their dues and complain that nothing is done for them they may not even get their money's worth. The second reason for the slow growth of the Institute is that its membership is carefully screened. Each application for admission is subjected to a close scrutiny by a hard-working Qualifications Committee, as well as by the National Council, before it is acted upon. It is by no means the intent that every one who has taken a few chemistry courses and failed of admission to a medical college should be accepted as a professional chemist. He must have had satisfactory training in chemistry, and evidence of professional growth over the years, before the Institute will welcome him to its fold.

Regarding the individuals who have been in lower grades of membership for many years without advancement in their grades of membership, there is some slight fault on the part of the Institute office, which should review the membership after a term of years and invite those who are eligible for higher grades to apply for them. The staff is overburdened and not always able to carry out this duty. After all, one expects a certain amount of initiative from a professional man and if some of these people are dissatisfied with their grade of membership they could initiate proceedings to be raised.

Finally, I am arranging that you will be invited to attend a meeting of the New York Chapter's Council so that you can gain more knowledge of the problems confronting those who work for the Institute, and the amount of labor which is being expended to solve these problems.

—Karl M. Herstein, F.A.I.C.

### On Profits

To the Editor:

The article in the October CHEMIST, entitled "What Management Expects of the Chemist," is most interesting. There are, however, statements therein which are presented as statements of fact, without proof that these statements are supported by facts.

For example, there appears the statement: "To re-emphasize, the making of

profits is synonymous with making a contribution to our industrial society. The two vary in direct ratio. Profits are the measure of efficiency. Efficiency based on the profit motive is the key to our prosperity," (*THE CHEMIST*, Oct. 1956, page 390.)

These statements are given as if proven mathematical formulae. But no proof of the variation in direct ratio is given. It is common knowledge that corporation common stock investments are usually made for profits obtained not from the dividends paid but rather from the stock splits and from the increase in stock value. For example, in the Feb. 22, 1956, issue of *The New York Times*, there appeared on the financial pages the item, "From Rags to Riches with 3M: How \$300. Grew to \$1,056,000." This article told how the purchase of 300 shares of 3M stock in 1915 at \$1.00 a share has now become 9,600 shares worth \$110 each. Other examples of stock increment are given on page 4294 of *Chemical & Engineering News*, Sept. 3, 1956. Thus \$1,000 in Merck stock bought on Dec. 31, 1935, was valued at \$13,423 on Dec. 31, 1955, but paid only \$3,633 in dividends. In short, more profits can be made through corporations by common stock transactions than by profits declared by said corporations.

In other words, do stockholders who sell their stock to take a profit make a contribution to our industrial society? Moreover, to consider the professional scientist in the same light as a piece worker or like wage earner who must yield to the company a profit for each hour or day's work is unjust.

One reason men become scientists is so that they will not be lumped in with the piece workers, who must show a profit for each day's work on pain of losing their jobs.

The chemist is profitable to the corporate employer and also to the national defense and also to society, albeit this profit cannot be reduced to X-dollars per day.

Stated otherwise, the mere fact that a corporation has a research laboratory, whether or not great inventions are discovered therein, is profitable to the sale of company common stock even though it may not be profitable in the sale of

company commodities. And the sale of company stock can, at times, be more profitable than the sale of company commodities.

—By a Fellow of the AIC  
(Name withheld on request.)

### Title of "FAIC" Omitted

To the Editor:

May I report my mild chagrin in observing that you omitted my AMERICAN INSTITUTE OF CHEMISTS' affiliation in the item about me in the January, 1957, *CHEMIST*? I have been a Fellow of the AIC in good standing since September 22, 1943.

—Milton A. Glaser, F.A.I.C.  
Waukegan, Ill.

**"Tower of Glass":** To be constructed by Corning Glass Works at 56th Street and Fifth Avenue, New York, N.Y. Corning Glass Works, Steuben Glass, Inc., and other associated firms will occupy most of the glass-sheathed office building's 365,000 square feet of space.

**New Company:** Planned as joint activity by Sylvania Electric Products, Inc., and Corning Glass Works, for purpose of activity in atomic energy field. Its name will be Sylvania-Corning Nuclear Corp.



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**Appointed:** James B. Weaver, F.A.I.C., as assistant director of the Economic Evaluations Department of Atlas Powder Company, Wilmington 99, Del. He joined the company's planning staff in 1954. Previously he was with Olin Industries, Inc., and Godfrey L. Cabot, Inc.

**Appointed:** Dr. John A. Yourtee, F.A.I.C., as technical superintendent of the Film Division plant of American Viscose Corporation, Marcus Hook, Pa. He has been coordinator of research and development at the Fredericksburg, Va. film plant for the past year.

**Opened:** In October, the new Midwestern Distribution Center, of Chas. Pfizer & Co., Inc., at 6460 West Cortland Street, Chicago, Ill. John E. McKeen, Hon. A.I.C., president and chairman of the board, in his address at the ceremonies, described Pfizer's new multi-spectrum antibiotic, Sigmamycin, as one that "could well be the most useful antibiotic of them all."

**Announced:** By Dr. Robert E. Hulse, F.A.I.C., vice president in charge of chemical activities for National Distillers Products Corporation that its subsidiary, National Petro-Chemicals Corp., will be in commercial production of medium-density polyethylenes by the end of the year.

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"New Line of Freezing Point Apparatus." Information. Phoenix Precision Instrument Co., Inc., 3803-05 N. 5th St., Philadelphia 40, Pa.

"X-rays Pierce Problems in Atomic Research." 4-pp folder. Instruments Div., North American Philips Co., 750 So. Fulton Ave., Mt. Vernon, N.Y.

"Trimethyl Aluminum, other Aluminum Alkyls, & Methyl Aluminum Sesquichloride." Information. U.S. Industrial Chemicals Co., Div. National Distillers Products Corp., 99 Park Ave., New York 16, N.Y.

"Combustion-Testing & Air Measurement Instruments." Bulletin No. 138. General Scientific Equipment Co., 7516 Limekiln Pike, Philadelphia 50, Pa.

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"Two New Tool Kits for Laboratory Technicians." Information, Burrell Corp., 2223 Fifth Ave., Pittsburgh 19, Pa.

"New Zeromatic (T.M.) pH Meter." Information, Scientific Instruments Div., Beckman Instruments, Inc., 2500 Fullerton Rd., Fullerton, Calif.

"Ovens and Incubators." Bulletin No. 376-C. Emil Greiner Co., 20-26 No. Moore St., New York 13, N.Y.

"Methylene Chloride, the Better Multipurpose Solvent." 24-pp booklet. Solvents Sales Dept., The Dow Chemical Co., Midland, Mich.

"Thermometers and Hydrometers." 24-pp booklet. Central Scientific Co., 1700 Irving Park Road, Chicago, Ill.

"Tomorrow's Metals." Vol. 28, No. 2 of *Foote Prints*. Foote Mineral Co., 18 West Chelten Ave., Philadelphia 44, Pa.

"Continuing Research Related to Water and Sewage Treatment." Text of paper by H. V. Moss. Association of American Soap & Glycerine Producers, Inc., 295 Madison Ave., New York 17, N.Y.

"The Acheson 'dag' Disperser." Publication by Acheson Colloids Co., Port Huron, Mich.

"New Water Soluble (DMHF) Resin." Samples and data available from Glyco Products Co., Inc., Empire State Bldg., New York 1, N.Y.

"Vaf - Brooks Positive Displacement Flowmeter." Bulletin No. 400. Brooks Rotameter Co., Lansdale, Pa.

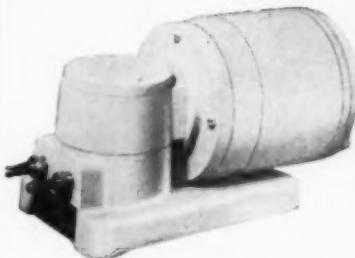
"Coumarin." Leaflet includes solubility tables. Organic Chemicals Div., Monsanto Chemical Co., 800 No. 12th Blvd., St. Louis 1, Missouri.

"New Research Microscopes with 'push-button' Illumination." Information. Bausch & Lomb Optical Co., 635 St. Paul St. Rochester, N.Y.

"Net Hot-plate Magnetic-stirrer Combination." Information: Fisher Scientific Co., 313 Fisher Bldg., Pittsburgh 19, Pa.

"What's New for the Laboratory." 24-pp booklet. Scientific Glass Apparatus Co., Inc., Bloomfield, N.J.

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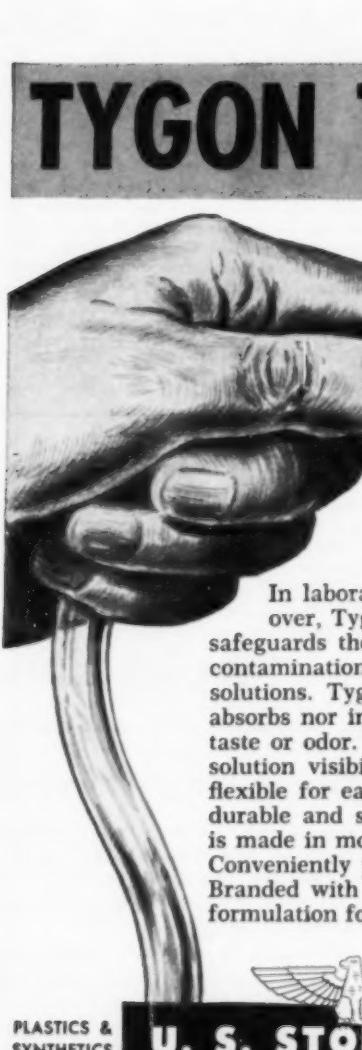


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